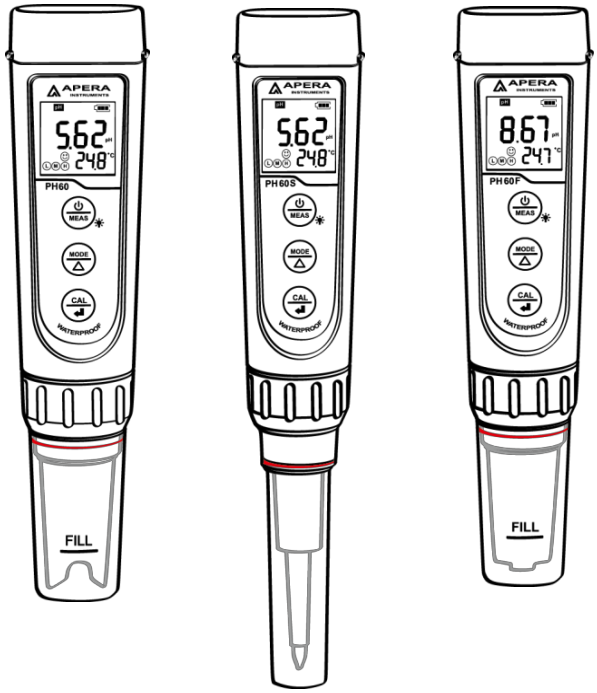
PH60 Series Premium pH Testers

Instruction Manual

PH60 pH Tester ■

PH60S Spear pH Tester □

PH60F Flat pH Tester □



RoHS compliant CE ISO 9001:2008 IP67 WATERPROOF

APERA INSTRUMENTS, LLC

www.aperainst.com

v5.6

Thank you for purchasing the Apera Instruments PH60 Series Premium pH Tester Kit. Please read this manual carefully before use in order to properly use and maintain the instrument.

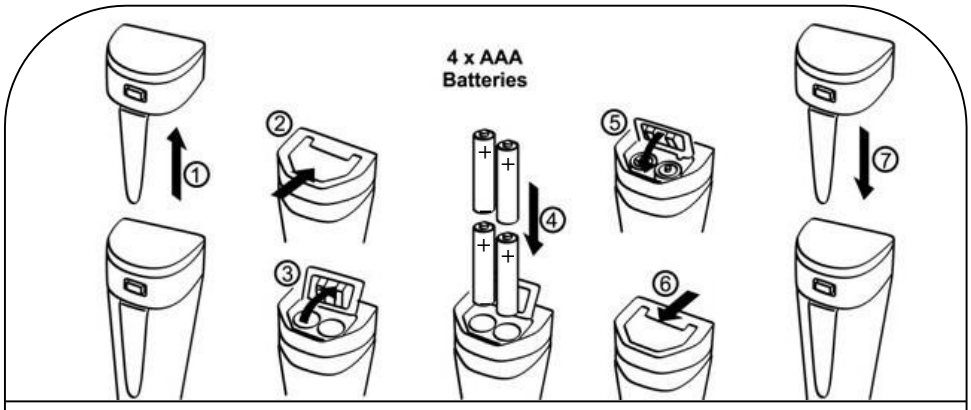
For video tutorials, please go to support.aperainst.com

Table of Contents

1. Battery Installation

Please install batteries according to the following steps. * Note the direction of batteries:

The Positive Side ("+") OF EVERY SINGLE Battery MUST FACE UP.
(WRONG INSTALLATION OF BATTERIES WILL CAUSE DAMAGE TO THE TESTER AND POTENTIAL HAZARDS



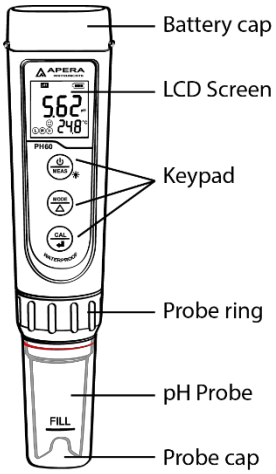
① Pull the battery cap up
② Slide the battery cap along to the direction of arrow
③ Open the battery cap
④ Insert the batteries **(ALL POSITIVE SIDES FACING UP)** (see graph)
⑤ Close the battery cap
⑥ Slide and lock the battery cap along to the direction of arrow
⑦ Fit the tester's cap while making sure to push all the way down. Thewaterproof feature may be compromised if the cap is not fitted correctly.

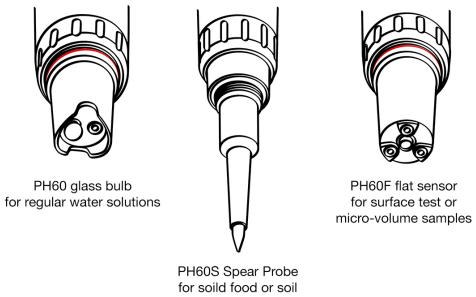
2. Keypad Functions

Short press: < 2 seconds

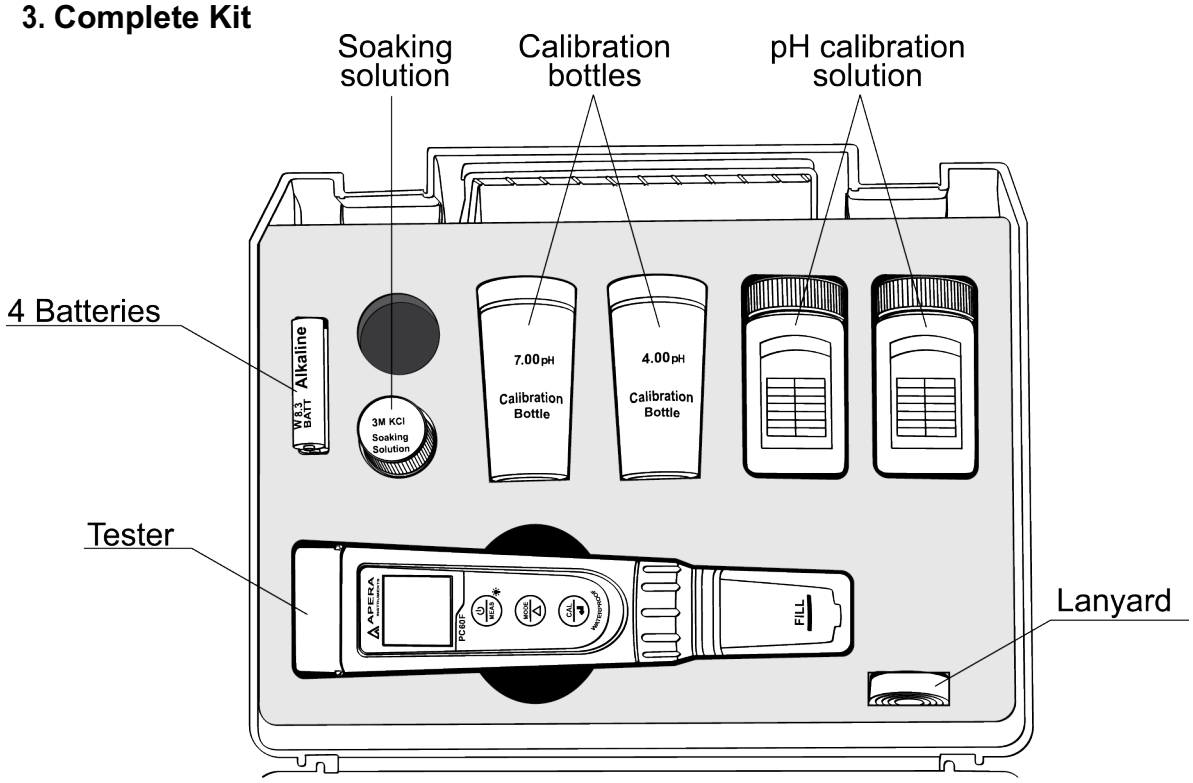
Long press: > 2 seconds

MEAS	1. Short press to turn on the tester and long press to turn off the tester. 2. When turned off, long press to enter parameter setting. 3. In measurement mode, short press to turn on backlight.
MODE	1. In measurement mode, short press to switch parameter from **pH** → **ORP** (Oxidation Reduction Potential), ORP probe sold separately. 2. In mode setting, short press to change parameter (Unidirectional).
CAL	1. Long press to enter calibration mode; 2. In calibration mode, short press to confirm calibration; 3. When measured value is locked, short press to unlock.





3. Complete Kit



Graph - 2

4. Preparation Before Use

4.1 PH60 and PH60F: If it is first-time use or the tester hasn't been used for a long time, pour some 3M KCL solution to the Fill line in the probe cap and soak the probe for about 15-30 minutes. Users can store the probe in the 3M KCL solution in the probe cap when the tester is not in use so as to keep the sensor's accuracy. To achieve maximum accuracy, we recommend soaking the probe in the 3M KCL storage solution overnight (12 hours) to activate the glass membrane thoroughly.

* Storing the PH60 and PH60F dry will **NOT** cause any permanent damage. It will only temporarily cause the probe to lose its sensitivity, which can always be restored by soaking in the storage solution.

4.2 PH60S: **NEVER** store the spear probe in a dry condition because permanent damage **CAN** be caused. The spear probe should always be stored in the 3M KCL soaking solution.

4.3 The storage solution is 3M KCL (potassium chloride). One bottle of 10mL storage solution comes with the tester kit. If the soaking solution was contaminated, please replace with new ones timely.

* **DO NOT** use any other brand's storage solutions because different chemicals may be used and potential permanent damage could be caused to the meter.

5. pH Calibration

Things needed in addition to what's in the box
A clean cup, distilled water (8-16oz), and tissue papers for rinsing and drying the probe.

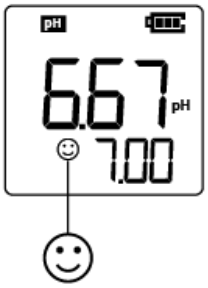
5.1 Short press (MEAS) to turn on.

5.2 Rinse the probe in distilled water; shake the meter in the air and use tissue paper to dap off excess water.

5.3 Pour certain amount (about half volume of the calibration bottles) of pH 7.00 pH and pH 4.00 buffer solutions in the correspondent calibration bottles.

5.4 Long press (CAL) to enter calibration mode (Short press (MEAS) to go back to measurement mode).

5.5 Dip the probe in pH 7.00 buffer solution, stir gently, and allow it to stand still in the buffer solution until a stable reading is reached – when stable icon ☺ appears and stays on the LCD screen (as shown in Diagram 2); short press (CAL) to complete 1-point calibration and the tester will return to measurement mode. Icon (M) will appear on the bottom left of the LCD screen, indicating the middle point of calibration has completed.



5.6 Rinse the probe in distilled water and dry it with tissue paper. Dip the probe into pH 4.00 buffer solution, follow the steps in 5.4 to 5.5 to complete 2-point calibration. Icons (L) (M) will appear on the bottom left of the LCD screen. If necessary, dip the probe into pH 10.01 buffer solution (sold separately), follow the steps in 5.4~5.5, to complete 3-point calibration. Indication icon (L) (M) (H) will appear on the bottom left of the LCD screen.

5.7 Notes

a) Tester can perform 1 to 3 points automatic calibration. *Please note that pH 7.00 (USA Standard) or pH 6.86 buffer solution (NIST Standard) must be used to conduct 1st point calibration. Then use other buffer solution to conduct 2nd or 3rd point calibration. Tester will recognize 5 kinds of pH buffer solutions. For details, please refer to the following table:

Calibration	USA Series	NIST Series	Indication icon	Recommended
1-point	7.00 pH	6.86 pH	(M)	Accuracy ≥ 0.1 pH
2-point	7.00 pH, 4.00 pH or 1.68 pH	6.86 pH, 4.01 pH or 1.68 pH	(L) (M)	Range < 7.00 pH
	7.00 pH, 10.01 pH or 12.45 pH	6.86 pH, 9.18 pH or 12.45 pH	(M) (H)	Range <7.00 pH
3-point	7.00 pH, 4.00 or 1.68 pH, 10.01 or 12.45 pH	6.86 pH, 4.01 or 1.68 pH, 9.18 pH or 12.45 pH	(L) (M) (H)	Range: 0 to 14.00 pH

b) pH 4.00 and pH 7.00 buffer solutions are included in the test kit, but pH 10.01 is not. Users can purchase it separately if needed. The buffer solutions poured into the calibration bottles are NOT for one-time use. They can be used for about ten to fifteen times as long as they are not contaminated and the bottles are covered when not in use. After that, we recommend replacing the buffer solutions in the calibration bottles with new ones that are in the buffer bottles (50ml ones) to keep the accuracy of the standard buffer solutions.

*Do not pour used buffer solutions back into the buffer bottles in case of contamination.

c) The tester has self-diagnostic functions:

Icons	Self-diagnostic information	Checking and how to fix
Er 1	Wrong pH buffer solution or the range of calibration solution exceeds standard.	a) Check whether pH buffer solution is correct (1st point calibration must be 7.00). b) Check whether the probe is damaged. c) Check if there is any air bubble in the glass bulb sensor
Er2	Press (CAL) key when reading is not stable during measurement.	Wait for the smiley face icon to appear and stay, then press (CAL)

*** If you find any air bubble in the glass bulb of the pH sensor, simply shake the probe for a few times to remove it. The existence of an air bubble in the glass bulb will cause instable measurements.**

*** The 1st point calibration must be 7.00 pH. Perform the 2nd point calibration (4.00 pH) immediately after the 1st point. Do NOT turn off the meter before you conduct 2nd point calibration. If the meter is turned off after 1st point calibration, users will need to restart the calibration process with the 7.00 pH first and the 4.00 pH following after. Calibrating directly in pH 4.00 after turning meter off and back on will cause Er1.**

6. pH Measurement

6.1 Short press (MEAS) to turn on the tester. Rinse the probe in distilled water, shake the meter and dap off excess water with tissue paper (do not rub or wipe the glass sensor). Dip the probe in sample solution, stir gently, and allow it to stand until a stable reading is reached. Get

readings after ☺ appears and stays on the screen.

6.2 Notes

a) Applications of each model:

Model/Probe	Application
PH60/Bulb probe	Regular water solutions' pH measurement such as hydroponics, aquaculture, pools and spas, water treatment, brewing, etc.
PH60S/Spear probe	Cheese, sushi rice, meat, fruit, bread, soil, solid culture medium and semi-solid medium measurement; also works well for regular water solution.
PH60F/Flat probe	Flat surface measurement such as skin, paper, fabric, leather and so on; micro sample testing; also works well for regular water solution.

b) PH60S Spear probe testers are widely used for solids containing water or semi-solid medium. When conducting such tests, pay attention to insert probe evenly, and be careful to prevent probe from damage. If the medium is too hard (such as meat or fruits), please bore a small hole with a knife before inserting the probe.

* For pH measurement of any food (such as sushi, cheese, etc.), it should be a sampling test. That means test samples should no longer be edible

c) PH60F Flat probe testers are mostly for flat surface sample test.

■ For skin test: skin should be without sweat or dirt, nor be overly cleaned (do not use facewash products before testing) to avoid affecting measurement results, dampen skin with some distilled water, slightly force flat probe onto the skin, get readings after value stabilized.

■ For paper, fabric and leather test: add 1~2 drops of distilled water on surface, then perform measurements.

■ For micro sample testing, use a container with an inner diameter<=19mm and a flat bottom. The tester can test volume >=0.5ml.

6.3 *Special Notes:*

a) The pH probe must be rinsed thoroughly after each use. Soap water should be used to clean off any grease or other contaminants.

*b) The PH60 series Pocket Tester will **NOT** give accurate or stable pH readings when **testing distilled or deionized water**. This is because distilled or deionized water do not have enough ions present for the electrode to function properly. To measure distilled or deionized water's pH, users need to use a specialized instrument. Contact us at info@aperainst.com for more details. When testing purified water like spring water or drinking water, it will take longer for the readings to get stabilized (typically 3-5 minutes) because there is very few ions left to be detected by the sensor in those purified water.*

*c) Do **NOT store probe in purified water** because that will cause permanent damage to the pH probe. Purified water is only recommended for rinsing the probe. The probe should be stored in 3M KCL pH electrode storage solution (SKU AI1120) for best accuracy.*

7. Parameter Setting

7.1 Setup Menu

Symbol	Contents	Parameter	Factory Default
P1	Select pH buffer solution	USA – NIST	USA
P2	Low value measurement alarm setting	0 ~ 14.00pH	0
P3	High value measurement alarm setting	0 ~ 14.00pH	14.00
P4	Select automatic lock	Off – On	Off
P5	Select backlight	Off - 1 - On	1
P6	Select temperature unit	℃ - ℉	℃
P7	Restore to factory default	No – Yes	No

7.2 Parameter setup method

When turned off, long press (MEAS) to enter parameter setting→Short press (MODE △) to switch P1-P2-…P7→Short press (CAL ↵), parameter flashing→Short press (MODE △) to choose parameter→Short press (CAL ↵) confirm→Long press (MEAS) to go back to measurement mode.

7.3 Parameter setting instruction

a) Select standard pH buffer solution (P1):

There are two options of standard buffer solutions: USA series and NIST series. Factory default is USA series, for details see clause 5.7.

b) Heads-Up Function (P2&P3)

Examples:

■ **Alert when measured value ≤ 3.20 pH:**

Preset lowest value (P2) = 3.20 pH, highest value (P3) = 14.00 pH, when measured value ≤ 3.20 pH (stable ☺ displays on LCD); LCD displays red backlight.

■ **Alert when measured value ≥ 8.60 pH:**

Preset highest value (P3) = 8.60 pH, lowest value (P2) = 0.00 pH, when measured value ≥ 8.60 pH (stable ☺ displays on LCD); LCD displays red backlight.

■ **Alert when measured value ≤ 3.20 pH or ≥ 8.60 pH**

Preset lowest value (P2) = 3.20 pH, highest value (P3) = 8.60 pH, when measured value is lower than 3.20 pH or higher than 8.60 pH (stable ☺ displays on LCD), LCD displays red backlight.

c) Automatic Lock (P4)

Select “On” to activate auto lock function. When reading is stable for more than 10 seconds, the tester will lock the value automatically, and **HOLD** icon will display on LCD. Press CAL key to cancel reading hold.

d) Backlight (P5)

“Off”-turn off backlight, “On”-always turn on backlight, “1”- backlight will last for 1 minute.

e) Temperature Unit (P5)

Select C˚ or F˚, the factory default is ˚F.

f) Factory default setting (P7)

Select “Yes” to recover instrument calibration to the theoretical value (pH value in zero potential is 7.00pH, slope is 100%), parameter setting return to initial value. This function can be used when instrument does not work properly in calibration or measurement. Calibrate and measure again after recovering the instrument to factory default status.

8. ORP Measurement

ORP stands for Oxidation-Reduction Potential. ORP is a measure of the cleanliness of the water & its ability to break down contaminants. Refer to Clause 11 to replace ORP probe (to be purchased separately), press MODE key to enter ORP mode. Rinse the probe in distilled water and dry it. Dip the probe in sample solution, stir gently, and allow it to stand still until a stable reading is reached. Get readings after ☺ appears and stays.

9. Technical Specifications

pH	Measuring Range	-2.00 – 16.00 pH
	Resolution	0.01pH
	Accuracy	±0.01pH ±1 digit
	Calibration Points	1 – 3 points
	Automatic Temperature Compensation (ATC)	0 – 50˚C (32 – 122˚F)
ORP (mV)	Measuring Range	± 1000mV
	Resolution	1mV
	Accuracy	±0.2% F.S
Temp.	Measuring Range	0 – 50˚C (32-122˚F)
	Resolution	0.1˚C
	Accuracy	±0.5˚C

10. Other Specifications

LCD	3-color LCD screen, Blue: Measurement; Green: Calibration; Red: Heads-Up
Reading Lock	**HOLD**
Low-Voltage Warning	Flashing, reminder of battery replacement needed
Auto. Power-Off	In 8 minutes without operation
Water Proof Rating	IP67
Power	DC3V, AAA batteries×4
Battery Life	Continuous operation＞2000 hours
Dimension/Weight	Tester: 40×40×178mm/133g; Case: 255×210×50mm/700g;

11. Probe Replacement

11.1 Twist off the probe ring, unplug the probe, plug in new probe (pay attention to probe's position), and twist on the probe ring.

11.2 The model numbers of replacement probes that are compatible with the PH60 Series testers are:

- PH60-E (Regular pH glass bulb probe)
- PH60S-E (Spear pH probe for solids/semi-solids pH testing)
- PH60F-E (Flat pH probe for surface pH testing)
- ORP60-E (ORP probe)

12. Limited Warranty

We warrant this instrument to be free from defects in material and workmanship and agree to repair or replace free of charge, at option of APERA INSTRUMENTS, LLC, any malfunctioned or damaged product attributable to responsibility of APERA INSTRUMENTS, LLC for a period of TWO YEARS (SIX MONTHS for the probe) from the delivery.

This limited warranty does not cover any damages due to:
Transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, modifications, combination or use with any products, materials, processes, systems or other matter not provided or authorized in writing by us, unauthorized repair, normal wear and tear, or external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

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